



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,995	02/18/2004	Larry S. Eoff	2002-IP-007848U1	3328

7590 07/25/2005
Robert A. Kent
Halliburton Energy Services
2600 South 2nd Street
Duncan, OK 73536-0440

EXAMINER

FULLER, BRYAN A

ART UNIT	PAPER NUMBER
----------	--------------

3676

DATE MAILED: 07/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/780,995

Applicant(s)

EOFF ET AL.

Examiner

Bryan A. Fuller

Art Unit

3676

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 93 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18, 20-30, 32, 36-63, 65-75 and 81-93 is/are rejected.
- 7) ☒ Claim(s) 19, 31, 33-35, 64, 76, & 78-80 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/18/04, 4/15/05, 4/29/05; 6/6/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 20 and 81 are objected to because of the following informalities: Both claims 20 and 81 are missing periods at the end of each claim. Appropriate correction is required.
2. Claim 20 is objected to because of the following informalities: Claim 20 recites the limitation "the first aqueous treating fluid" in lines 3 and 4. There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.
3. Claim 20 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 20 is written with the same limitation as claim 2.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 – 10, 12 – 14, 16 – 17, 20 – 30, 32, 36 – 39, 41 – 55, 57 – 59, 61 – 62, 65 – 75, 77, 81 – 84, and 86 – 90 are rejected under 35 U.S.C. 102(b) as being anticipated by Weaver et al (4,532,052).

With respect to claims 1 and 46: Weaver et al teaches in column 5, lines 1 – 58 and in column 9, lines 49 – 63 a method of temporarily reducing the permeability of one or more selected sections of a subterranean formation penetrated by a horizontal well bore and the flow of water or water and hydrocarbons or hydrocarbons therefrom and restoring the permeability and flow when required comprising the steps of:

- (a) preparing or providing an aqueous treating fluid comprising water and a water- soluble formation permeability reducing agent selected from the group consisting of a hydrophobically modified water-soluble polymer, a hydrophilically modified water-soluble polymer and a hydrophobically modified water-soluble polymer comprising polar heteroatoms within the polymer backbone;
- (b) introducing the first aqueous treating fluid containing the water-soluble formation permeability reducing agent into the one or more selected sections so that the permeabilities and flows of water or water and hydrocarbons or hydrocarbons therefrom are reduced, and
- (c) when required, contacting said one or more selected sections with a second aqueous treating fluid comprising water and a formation permeability restoring chemical.

With respect to claims 2, 20, 36, 47, 65, and 81: Weaver et al teaches in column 21, lines 21 – 25 a method wherein the water-soluble formation permeability reducing agent is a hydrophobically modified water-soluble polymer comprising polar heteroatoms within the polymer backbone present in the aqueous treating fluid in an

Art Unit: 3676

amount in the range of from about 0.1% to about 10% by weight of the aqueous treating fluid.

With respect to claims 44 and 89: Weaver et al teaches in column 5, lines 17 – 22 a method wherein the aqueous treating fluid further comprises a gelling agent.

With respect to claims 3, 21, 48, and 66: Weaver et al teaches in column 19, lines 7 – 10 a method wherein the hydrophobically modified water-soluble polymer is the reaction product of a hydrophilic reactive polymer and a hydrophobic compound.

With respect to claims 12 and 57: Weaver et al teaches in column 19, line 66 – column 20, line 3 a method wherein the hydrophobically modified water-soluble polymer is a reaction product of a hydrophilic monomer and a hydrophobically modified hydrophilic monomer.

With respect to claims 16, 32, 45, 61, 77, and 90: Weaver et al teaches in column 6, lines 25 – 45 a method wherein the hydrophobically modified water-soluble polymer comprising polar heteroatoms within the polymer backbone has a molecular weight in the range of from about 100,000 to about 10,000,000.

With respect to claims 37 – 38 and 82 - 83: Weaver et al teaches in column 6, lines 12 – 25 a method wherein the hydrophobically modified water-soluble polymer comprising polar heteroatoms within the polymer backbone is the reaction product of a hydrophilic polymer comprising polar heteroatoms within the polymer backbone and a hydrophobic compound. Weaver et al also teaches a method wherein the polar heteroatoms present in the polymer backbone of the hydrophobically modified water-

Art Unit: 3676

soluble polymer are selected from the group consisting of oxygen, nitrogen, sulfur and phosphorous.

With respect to claims 4, 9, 22, 41, 49, 54, 67, and 86: Weaver et al teaches in column 14, lines 29 – 68 a method wherein the hydrophilic reactive polymer comprises a reactive amino group and where the hydrophobic compound is selected from the group consisting of an alkyl halide, a sulfonate, a sulfate, and an organic acid derivative.

With respect to claims 5 – 8, 13 – 14, 23 – 28, 50 – 53, 58 – 59, and 68 - 73: Weaver et al teaches in column 19, line 66 – column 20, line 29 a method wherein the hydrophilic reactive polymer is a product of a polymerization reaction in which at least one monomer is selected from the group consisting of dimethylaminoethyl methacrylate and dimethylaminopropyl methacrylamide, wherein the hydrophilic reactive polymer is selected from the group consisting of polyethyleneimine, polyvinylamine, poly(vinylamine/vinyl alcohol), chitosan and polylysine, wherein the hydrophilic reactive polymer comprises an alkyl acrylate polymer, and wherein the alkyl acrylate polymer is selected from the group consisting of polydimethylaminoethyl methacrylate, polydimethylaminopropyl methacrylamide, poly(acrylamide/dimethylaminopropyl methacrylate), poly(acrylamide/dimethylaminopropyl methacrylamide) and poly(acrylic acid/dimethylaminoethyl methacrylate).

Weaver et al also teaches a method wherein the hydrophilic monomer is selected from the group consisting of acrylamide, 2-acrylamido-2-methyl propane sulfonic acid, N,N-dimethylacrylamide, vinyl pyrrolidone, dimethylaminoethyl methacrylate, acrylic acid, dimethylaminopropyl methacrylamide, vinyl amine, trimethylammoniummethyl

Art Unit: 3676

methacrylate chloride, methacrylamide and hydroxyethyl acrylate and a method wherein the hydrophobically modified hydrophilic monomer is selected from the group consisting of alkyl acrylates, alkyl methacrylates, alkyl acrylamides and alkyl methacrylamides wherein the alkyl radicals have from about 4 to about 30 carbon atoms; alkyl dimethylammoniummethyl methacrylate bromide, alkyl dimethylammoniummethyl methacrylate chloride and alkyl dimethylammoniummethyl methacrylate iodide wherein the alkyl radicals have from about 4 to about 30 carbon atoms; and alkyl dimethylammoniumpropyl methacrylamide bromide, alkyl dimethylammoniumpropyl methacrylamide chloride and alkyl dimethylammoniumpropyl methacrylamide iodide wherein the alkyl groups have from about 4 to about 30 carbon atoms.

With respect to claims 10, 11, 43, 55, 56, and 88: Weaver et al teaches in column 19, lines 53 – 60 a method wherein the alkyl halide or the hydrophobic compound comprises an alkyl chain of from about 4 to about 30 carbon atoms. This would also teach the hydrophobic compound that comprises cetyl bromide.

With respect to claims 17 and 62: Weaver et al teaches in column 7, lines 20 – 26 a method wherein the hydrophilic monomer and the hydrophobically modified hydrophilic monomer are present in the hydrophobically modified water-soluble polymer at a mole ratio of from about 99.98:0.02 to about 90:10.

With respect to claims 29 – 30 and 74 - 75: Weaver et al teaches in column 13, lines 7 – 42 a method wherein the hydrophilic compound is selected from the group consisting of halogen containing polyethers. More specifically, Weaver et al teaches a

Art Unit: 3676

method wherein the polyether is selected from the group consisting of polyethylene glycol, polypropylene glycol, polybutylene glycol, and mixtures thereof.

With respect to claims 39 and 84: Weaver et al teaches in column 19, line 66 – column 20, line 29 a method wherein the hydrophilic polymer comprising polar heteroatoms within the polymer backbone is selected from the group consisting of a cellulose, a chitosan, a polyamide, a polyetheramine, a polyethyleneimine, a polyhydroxyetheramine, a polylysine, a polysulfone and a starch.

With respect to claims 42 and 87: Weaver et al teaches in column 15, lines 33 – 40 a method wherein the organic acid derivative is selected from the group consisting of an octenyl succinic acid, a dodecenyl succinic acid, and an anhydride, ester, or amide of octenyl succinic acid or dodecenyl succinic acid.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 15, 18, 60, and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weaver et al in view of Eoff et al (6,497,283).

With respect to claims 15, 18, 60, and 63: Weaver et al teaches the features as claimed except for the use of hexadecyldimethylaminopropylmethacrylamide bromide as one of the monomers in a copolymer or terpolymer. Eoff et al teaches in column 2, line

Art Unit: 3676

40 – column 3, line 10 and in Table 10 the method wherein

hexadecyldimethylaminoropylmethacrylamide bromide is used as one of the monomers in a copolymer or terpolymer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Weaver et al's invention by using hexadecyldimethylaminoropylmethacrylamide bromide as one of the monomers in a copolymer or terpolymer in view of Eoff et al. The motivation for this combination is that the use of the monomer and the copolymers and terpolymers comprising that monomer is that the monomer gives the terpolymer unique associative properties, which provide increased effectiveness to the terpolymer.

8. Claims 40 and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weaver et al in view of Heier et al (6,380,137).

With respect to claims 40 and 85: Weaver et al teaches the features as claimed except for wherein the starch of claim 39 comprises a cationic starch. Heier et al teaches in column 1, lines 21 –35 a method wherein the starch comprises a cationic starch. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Weaver et al's invention by using a cationic starch as the starch in view of Heier et al. The motivation for this combination is that a starch polymer is one of the most common additives for controlling the viscosity and water loss of drilling fluids.

9. Claims 91 – 93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weaver et al in view of Chang et al (4,708,974).

With respect to claims 91 - 93: Weaver et al teaches the features as claimed except for wherein the formation permeability restoring chemical in the second aqueous treating fluid is selected from the group consisting of alkali, alkaline earth and transition metal salts of periodate, hypochlorite, perbromate, chlorite, chlorate, hydrogen peroxide, peracetic acid, soluble peroxide salts, persulfate salts, percarboxylate acids, oxyhalo acids and mixtures thereof. More specifically, Weaver et al teaches a method wherein the permeability restoring chemical is sodium hypochlorite and where the permeability restoring chemical is present in the second aqueous treating fluid in an amount in the range of from about 1% to about 25% by weight of the second aqueous treating fluid. Chang et al teaches in column 5, lines 50 – 66 a method wherein the formation permeability restoring chemical in the second aqueous treating fluid is selected from the group consisting of alkali, alkaline earth and transition metal salts of periodate, hypochlorite, perbromate, chlorite, chlorate, hydrogen peroxide, peracetic acid, soluble peroxide salts, persulfate salts, percarboxylate acids, oxyhalo acids and mixtures thereof. More specifically, Chang et al teaches a method wherein the permeability restoring chemical is sodium hypochlorite and where the permeability restoring chemical is present in the second aqueous treating fluid in an amount in the range of from about 1% to about 25% by weight of the second aqueous treating fluid. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Weaver et al's invention by selecting the formation permeability restoring chemical in the second aqueous treating fluid from the group consisting of alkali, alkaline earth and transition metal salts of periodate, hypochlorite, perbromate,

Art Unit: 3676

chlorite, chlorate, hydrogen peroxide, peracetic acid, soluble peroxide salts, persulfate salts, percarboxylate acids, oxyhalo acids and mixtures thereof. More specifically, using sodium hypochlorite as the permeability restoring chemical, where the permeability restoring chemical is present in the second aqueous treating fluid in an amount in the range of from about 1% to about 25% by weight of the second aqueous treating fluid in view of Heier et al. The motivation for this combination is that it allows for the selective modification of the permeability of the strata of the reservoir.

Allowable Subject Matter

10. Claims 19, 31, 33 – 35, 64, 76, and 78 – 80 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan A. Fuller whose telephone number is (571) 272-8119. The examiner can normally be reached on M - Th 7:30 - 5:00 and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian E. Glessner can be reached on (571) 272-6843. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 3676

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Brian E. Glessner
Supervisory Patent Examiner
Art Unit 3676

baf